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Association between integrated specialist–generalist outpatient care and patient-reported primary care experience among patients with chronic diseases in Shanghai: a cross-sectional study

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Abstract

Background

Integrated specialist–generalist outpatient care has been introduced in Chinese community health service centres to strengthen chronic disease management. However, whether this model improves patient-reported primary care experience remains unclear. This study compared primary care experiences between patients attending integrated specialist–generalist clinics and general outpatient clinics in Shanghai.

Methods

A multistage cross-sectional survey was conducted from June to October 2024 among patients with chronic diseases who attended community health service centres in Shanghai where integrated specialist–generalist care models had been implemented. Participants were recruited from either integrated specialist–generalist clinics for specific chronic diseases or general outpatient clinics. Patient-reported primary care experience was assessed using the Primary Care Assessment Tool–Adult Short version. Analysis of variance was used to compare characteristics and primary care experience scores between groups. Multivariable linear regression was performed to identify factors associated with the total primary care experience score.

Results

A total of 581 valid questionnaires were included in the analysis. Compared with patients attending general outpatient clinics, those attending integrated specialist–generalist clinics reported significantly higher scores across all primary care experience domains and a higher total Primary Care Assessment Tool–Adult Short version score. In multivariable linear regression analysis, attending an integrated specialist–generalist clinic was positively associated with the total primary care experience score after adjustment for patient characteristics and health-related factors ($\beta = 0.195, P < 0.001$). Other factors independently associated with higher total scores included age ≥ 71 years ($\beta = 0.179, P < 0.001$), awareness of the harms associated with chronic diseases ($\beta = 0.166, P < 0.001$), and receiving disease-related health education from attending physicians or family doctors ($\beta = 0.181, P < 0.001$).

Conclusions

Integrated specialist–generalist outpatient care was associated with better patient-reported primary care experiences among patients with chronic diseases. These findings suggest that this care model may be more conducive to chronic disease management in community health service centres. Further efforts are needed to strengthen care coordination, particularly referral processes, and to enhance community-oriented service delivery.

Introduction

Primary healthcare services constitute the most fundamental level of the healthcare system [1], and the quality of these services is directly related to the health and well-being of the population [2]. Because China's referral system is not mandatory, patients can directly visit specialists in large hospitals without first obtaining referrals from community general practitioners [3]. As a result, many patients prefer to seek care directly from tertiary or specialized hospitals. To promote greater utilization of primary healthcare services, government authorities have encouraged community health institutions to integrate diverse medical resources, expand service models, and guide patients to choose primary care as their first point of contact.

Shanghai was the first city in China to pilot the integration of general and specialist care within community-based healthcare services [4]. Following the success of this initiative, the integrated general–specialist care model has attracted increasing attention across the health sector and has since been promoted in many primary healthcare institutions nationwide [5]. Between 2019 and 2020, the Shanghai Municipal Health Commission successively issued two key policy documents: Implementation Opinions on Enhancing Regional Healthcare Service Capacity and Improving the Hierarchical Medical System [6], and Work Plan for Promoting the Construction of Community Hospitals in Shanghai [7]. Both documents emphasized strengthening core functions, consolidating service capacity, and expanding service scope to comprehensively enhance community health service centres' ability to meet residents' diverse healthcare needs.

Several community health service centres have leveraged close collaborations with higher-level medical institutions to establish various integrated general–specialist outpatient clinics based on the health needs of their local populations. These include clinics in surgery, gynecology, pediatrics, ophthalmology, dermatology, and psychiatry (or psychology). In addition, some primary healthcare institutions have introduced traditional Chinese medicine (TCM) specialty services [8], such as TCM treatments for musculoskeletal disorders, gynecological diseases, and dermatological conditions.

In recent years, numerous studies in China have focused on evaluating the quality of primary healthcare services, addressing topics such as chronic disease management, family doctor contracting services, and community residents' perceptions of healthcare quality in different regions. Our research team has previously conducted several related studies [9, 10]. For example, Jin et al. (2021) examined primary healthcare experiences among patients with multimorbidity in primary healthcare institutions in Shanghai [9]. More recently, Yang et al. (2025) reported improvements in perceptions of primary healthcare in Shanghai, although urban–suburban disparities persisted. Although gaps in service accessibility and comprehensiveness have narrowed—suggesting progress toward equity—key determinants continue to include residential location, chronic disease burden, psychological distress, and self-rated health [10]. Other scholars have contributed to this field as well. Lu et al. (2023) investigated the relationship between primary healthcare experiences in primary healthcare institutions and glycemic control among patients with diabetes [11], and Xu et al. (2024) analyzed contracted residents' evaluations of care coordination in primary healthcare institutions and its influencing factors [12]. However, few studies have explored how patients receiving integrated general–specialist care services evaluate community healthcare quality.

The capacity for integrated general–specialist care within community settings has emerged as a developmental approach to strengthen primary healthcare services and enable residents to access high-quality medical care at the community level. This concept refers to the establishment of a service model in which community health institutions, while maintaining their foundation in general practice, enhance their

specialty or disease-specific diagnostic and treatment capabilities. The focus is on managing common and frequently occurring diseases as well as addressing prevalent health concerns. Through the integration of general practice with specialty expertise, primary healthcare institutions can develop a healthcare delivery model characterized by general practice as the foundation and specialized or disease-focused services as distinctive features [13].

This study employed the Chinese version of the Primary Care Assessment Tool–Adult Short version (PCAT-AS) to evaluate the quality of medical services provided by community health service centres implementing integrated general–specialist care. The aim was to identify the strengths and weaknesses of current service quality and to provide empirical evidence for enhancing community healthcare capacity and improving patients' care experiences. From the perspective of patients' objective experiences with healthcare services, the study assessed how individuals with chronic diseases evaluated community healthcare based on the integrated general–specialist service model. It further analyzed differences in perceived service quality between similar patient groups who received care either from integrated general–specialist outpatient clinics or from general outpatient clinics, adopting a health equity perspective to examine the quality of community health services.

Although this study was conducted in China, its findings have broader implications for other countries and regions seeking to reform primary healthcare services. Moreover, the results may provide valuable reference points for low- and middle-income countries aiming to implement similar integrated healthcare service models.

Methods

Study Setting

This study employed a cross-sectional survey design and targeted chronic disease patients attending community health service centres in Shanghai that implemented integrated general–specialist care. The study population included patients visiting integrated general–specialist outpatient clinics for specific diseases and those attending general outpatient clinics. Shanghai, as a pilot region for national healthcare reforms and policy implementation, has gradually expanded the scope of integrated general–specialist care services in community health service centres to include disease treatment, chronic disease management, maternal and child healthcare, and health checkups [14]. Given that diabetes and chronic obstructive pulmonary disease (COPD) are prevalent in the community and affect a large patient population, this study focused on these two chronic diseases. According to a 2021 survey in Shanghai, 187 primary healthcare institutions had established integrated general–specialist outpatient clinics, with diabetes and COPD clinics ranking among the top two most common specialty clinics [4]. Therefore, this study used diabetes and COPD patients as case examples.

A multistage sampling method was used in this study (Fig. 1). In the first stage, all primary healthcare institutions offering integrated general–specialist care were categorized by geographic location: urban, suburban, and rural. Using a computer-generated random number list, three primary healthcare institutions were selected from the urban and suburban categories, while two were selected from the rural category (the total number of rural centres offering integrated general–specialist care was lower than in the urban and suburban categories). In the second stage, based on the types of integrated general–specialist care offered at

each centre, four primary healthcare institutions with diabetes outpatient clinics and four with COPD outpatient clinics were selected. The general outpatient clinics in these eight selected primary healthcare institutions served as the sample for the general outpatient group. In accordance with the principle of sampling balance, one additional general outpatient clinic was randomly selected from each of the eight centres, resulting in a total of eight general outpatient clinics. In the third stage, we contacted the randomly selected primary healthcare institutions to ask if they were willing to participate in the study. All eight centres agreed to participate in the research.

Data Collection

Sample Size Calculation for Diabetes Outpatient Clinic Patients

The sample size for the diabetes outpatient group was calculated using the formula: $N = \mu^2_{\alpha/2} \times P \times (1-P)/\delta^2 \times deff$, the minimum sample size was estimated to be 143. In this formula, P represents the prevalence of type 2 diabetes among Chinese residents, reported as 10.40% in existing literature [15]. The design effect (*deff*) was set at 1.0, the relative error δ was set at 5%, and the critical value $\mu_{\alpha/2}$ was set at 1.96. Sample size estimation for the general diabetes outpatient group, based on the same formula and diabetes prevalence, also indicated a minimum sample size of 143. Considering potential errors in the effective questionnaire response rate, the sample size was increased by 15%.

Sample Size Calculation for COPD Outpatient Clinic Patients:

Similarly, the sample size for the COPD outpatient group was calculated using the same formula: $N = \mu^2_{\alpha/2} \times P \times (1-P)/\delta^2 \times deff$,the minimum sample size for the COPD group was estimated to be 121. In this case, P refers to the prevalence of COPD among adults aged 20 and older in China, which has been reported as 8.60% in the literature [16]. As with the diabetes group, the design effect (*deff*) was set at 1.0, the relative error δ was 5%, and the critical value $\mu_{\alpha/2}$ was 1.96. The sample size for the general COPD outpatient group was also estimated to be 121, and, similarly, the sample size was increased by 15% to account for potential errors in questionnaire response rates.

Inclusion Criteria for Study Participants:

Participants were recruited based on the following criteria: 1) diagnosed with the specified disease (diabetes or COPD); 2) aged 18 years or older; 3) received treatment at the designated community health service centre for at least one year.

Data collection was conducted from June to October 2024. Data were obtained through face-to-face interviews using paper-based questionnaires. To minimize interviewer bias, all interviewers received standardized training prior to data collection to ensure consistency in the administration of questions and the recording of responses.

Survey tools

Participants' experiences with primary healthcare were measured using the PCAT-AS. This tool was developed by the Primary Care Policy Centre at Johns Hopkins University based on a theoretical framework of Primary Health Care (PHC) attributes and characteristics, as well as the Structure-Process-Outcome (SPO) service quality assessment model proposed by Avedis Donabedian, the "father of medical management" [17]. The PCAT was designed to assess the scope and quality of primary healthcare services and is internationally recognized as a systematic and comprehensive tool for evaluating PHC quality [18–20].

The PCAT-AS has been extensively used in China [11, 21, 22], where its reliability has been validated. The PCAT-AS consists of 36 items across 10 dimensions: first-contact utilization, first-contact accessibility, continuity of care, coordination (referrals), coordination (information systems), comprehensiveness (available services), comprehensiveness (service delivery), patient- and family-centred care, community orientation, and patient-provider communication. The tool employs a five-point Likert scale for evaluation, where each item has five response options: 1 = definitely not, 2 = probably not, 3 = probably yes, 4 = definitely yes, and 9 = unsure/don’t know. These options are scored as 4, 3, 2, 1, and 2.5, respectively [23]. The score for each dimension is calculated as the average score of all items within that dimension. The total PCAT-AS score is the sum of the scores for all dimensions. Higher scores indicate better patient experiences.

Additionally, the questionnaire included demographic items such as gender, age, residential status, education level, health insurance coverage, and self-assessed healthcare cost burden. It also gathered information about patients' knowledge of their chronic diseases, including whether they were aware of the risks associated with their conditions and whether their primary care or family doctor had provided health education related to their disease (see Appendix 1). Before data and sample collection, written informed consent was obtained from all participants. This study was approved by the Ethics Committee of Tongji University’s Affiliated Yangpu Hospital (Approval No.:LL-2024-LW-035).

Statistical analysis

Based on the type of outpatient clinic visited by chronic disease patients, the sample was divided into two groups: the specialized outpatient clinic group and the general outpatient clinic group. Chi-square tests were used to compare the demographic characteristics and healthcare utilization between the two groups. Independent samples t-tests were conducted to analyze the overall attributes of primary healthcare services between the two groups. Subsequently, multiple linear regression analysis was performed to further compare the two groups while controlling for demographic characteristics (such as gender, age, residential status, education level, type of health insurance, and self-assessed healthcare cost burden) and healthcare utilization indicators (such as awareness of the risks associated with their chronic disease and whether the attending physician or family doctor had provided relevant health education). This analysis aimed to explore the relationship between the type of outpatient clinic visited and the total PCAT score. Regarding coordination (referrals), 429 chronic disease patients (73.8%) reported having a referral experience. Therefore, the coordination (referrals) dimension score was also included in the multiple linear regression analysis. All data analyses were performed using SPSS version 27.0, with statistical significance set at $P < 0.05$.

Results

1. Basic Demographic Information of Chronic Disease Patients

As shown in Table 1, a total of 581 patients with chronic diseases participated in the study, including 289 from the specialized outpatient clinic group and 292 from the general outpatient clinic group. Among the participants, 307 (52.8%) were male and 274 (47.2%) were female. The age distribution was as follows: 147 patients (25.3%) were ≤ 60 years, 173 (29.8%) were aged 61–70 years, and 261 (44.9%) were ≥ 71 years. Regarding residency status, 501 participants (86.2%) had Shanghai household registration, while 76 participants (13.1%) were non-Shanghai residents. The education levels were: 104 participants (17.9%) had completed primary school, 215 (37.01%) had completed middle school, 160 (27.5%) had completed high school, and 102 (17.6%) had university education or higher. In terms of health insurance coverage, 348 participants (59.9%) were covered by urban employee health insurance, and 187 participants (32.2%) were covered by urban-rural resident health insurance (**Supplementary file 1**).

Table 1

Characteristics of chronic disease patients in the study

Variable	Group	Total(*n* = 581)		The specialized outpatient clinic group (*n* = 289)		The general outpatient clinic group (*n* = 292)		Chi-square	*P* value
		N	%	*N*	%	*N*	%		
Gender	Male	307	52.8	149	51.6	158	54.1	0.379	0.538
	Female	274	47.2	140	48.4	134	45.9		
Age (years)	≤ 60	147	25.3	73	25.3	74	25.3	0.030	0.862
	≥ 61,≤70	173	29.8	88	30.5	85	29.1		
	≥ 71	261	44.9	128	44.3	133	45.6		
Residential status	Registered residence population of Shanghai	501	86.2	248	85.8	253	86.6	0.002	0.961
	Non registered residence in Shanghai (Residing for more than six months)	76	13.1	40	13.8	36	12.3		
	Floating population	4	0.7	1	0.4	3	1.0		
Education	Primary school or below	104	17.9	53	18.3	51	17.5	0.013	0.910
	Junior school	215	37.0	107	37.0	108	37.0		
	Senior high school	160	27.5	77	26.6	83	28.4		
	College or above	102	17.6	52	18.0	50	17.1		
Type of health insurance	Urban employee medical insurance	348	59.9	181	62.0	167	57.8	0.007	0.933
	Urban and rural residents' medical insurance	187	32.2	84	28.8	103	35.6		

Variable	Group	Total(*n* = 581)		The specialized outpatient clinic group (*n* = 289)		The general outpatient clinic group (*n* = 292)		Chi-square	*P* value
		N	**%**	***N***	**%**	***N***	**%**		
	Poverty medical assistance	15	2.6	10	3.4	5	1.7		
	Other (such as commercial medical insurance, etc.)	31	5.3	17	5.8	14	4.8		
Self evaluation of the level of medical expense burden	Completely affordable	209	36.0	92	31.8	117	40.1	1.517	0.218
	Affordable	270	46.5	147	50.9	123	42.1		
	Average	83	14.3	41	14.2	42	14.4		
	A bit difficult	17	2.9	7	2.4	10	3.4		
	Very difficult	2	0.3	2	0.7	0	0.0		
Are you aware of the risks of chronic diseases	Yes	525	90.4	283	97.9	242	82.9	37.694	<0.001
	No	56	9.6	6	2.1	50	17.1		
Has the attending physician or family doctor conducted relevant disease health education	Yes	495	85.2	280	96.9	215	73.6	62.182	<0.001
	No	86	14.8	9	3.1	77	26.4		

The proportion of patients in the specialized outpatient clinic group who were aware of the risks associated with their chronic disease was 97.9%, higher than the 92.8% in the general outpatient clinic group. Additionally, the proportion of patients in the specialized outpatient clinic group whose attending physician or family doctor had provided relevant disease-related health education was 96.9%, significantly higher than the proportion in the general outpatient clinic group.

2. Comparison of PCAT-AS Scores for Chronic Disease Patients

The overall average PCAT-AS score for chronic disease patients in this study was 32.14 ± 4.72. Among the 10 dimensions, the highest average score was in "Comprehensiveness (Service Delivery)" (3.45 ± 0.53), followed by "First-contact Utilization" (3.44 ± 0.58), "Cultural competence" (3.37 ± 0.58), "Family-centredness" (3.30 ±

0.57), "Comprehensiveness (Available Services)" (3.28 ± 0.56), "Coordination (Information Systems)" (3.27 ± 0.53), "First-contact Accessibility" (3.21 ± 0.53), "Continuity of Care" (3.21 ± 0.56), and "Community Orientation" (3.15 ± 0.60). The lowest average score was found in "Coordination (Referrals)" (2.46 ± 1.57) (**Supplementary file 2**).

Chronic disease patients generally reported a high-quality experience with primary healthcare services, especially in the dimensions of first-contact utilization, comprehensiveness (service delivery), and patient-provider communication (Fig. 2A, **appendix table 1**). When comparing the PCAT-AS scores and total scores between the specialized outpatient clinic group and the general outpatient clinic group, the specialized outpatient clinic group consistently scored higher across all dimensions and the total PCAT-AS score, with statistically significant differences ($P < 0.05$).

Among patients with diabetes, the mean scores for all PCAT-AS dimensions and the total scale score in the specialized diabetes clinic group were significantly higher than those in the general outpatient group ($P < 0.05$, Fig. 2B, **appendix table 2**). Similarly, among patients with COPD, the total scale score in the specialized COPD clinic group was significantly higher than that in the general outpatient group ($P < 0.05$). Specifically, the COPD patients in the specialized clinic group reported significantly higher scores in five dimensions—first-contact utilization, first-contact accessibility, comprehensiveness (available services), comprehensiveness (service provision), and family-centredness—compared with those in the general outpatient group ($P < 0.05$). No statistically significant differences were observed between the two groups in the dimensions of continuity, coordination (referrals), coordination (information systems), community orientation, and cultural competence ($P > 0.05$, Fig. 2C, **Appendix Table 3**).

Table 2
Linear regressions on total PCAT-AS scores

Variable	Group	Model I			Model II		
		ß	T value	*P* value	ß	T value	*P* value
Sociodemographic characteristics							
Outpatient category	The general outpatient clinic group	Reference			Reference		
	The specialized outpatient clinic group	0.279	7.001	<0.001	0.195	4.965	<0.001
Gender	Male	/	/	/	Reference		
	Female	/	/	/	0.007	0.191	0.849
Age (years)	≤ 60	/	/	/	Reference		
	61–70	/	/	/	0.074	1.582	0.114
	≥ 71	/	/	/	0.179	3.669	<0.001
Residential status	Registered residence population of Shanghai	/	/	/	Reference		
	Non registered residence in Shanghai (Residing for more than six months)	/	/	/	-0.01	-0.236	0.814
	floating population	/	/	/	-0.014	-0.359	0.719
Education	Primary school or below	/	/	/	Reference		
	Junior school	/	/	/	0.008	0.148	0.882
	Senior high school	/	/	/	-0.012	-0.225	0.822
	College or above	/	/	/	0.004	0.078	0.938
Type of health insurance	Urban employee medical insurance	/	/	/	Reference		
	Urban and rural residents'	/	/	/	-0.194	-5.045	<0.001

Variable	Group	Model I			Model II		
		ß	T value	*P* value	ß	T value	*P* value
Sociodemographic characteristics							
	medical insurance						
	Poverty medical assistance	/	/	/	-0.078	-1.953	0.051
	Other (such as commercial medical insurance, etc.)	/	/	/	-0.101	-2.208	0.028
Self evaluation of the level of medical expense burden	Completely affordable	/	/	/	Reference		
	Affordable	/	/	/	-0.137	-3.276	0.001
	Average	/	/	/	-0.099	-2.352	0.019
	A bit difficult	/	/	/	-0.023	-0.556	0.579
	Very difficult	/	/	/	0.022	0.599	0.55
Health service utilization							
Are you aware of the risks of chronic diseases	No	/	/	/	Reference		
	Yes	/	/	/	0.166	4.031	<0.001
Has the attending physician or family doctor conducted relevant disease health education	No	/	/	/	Reference		
	Yes	/	/	/	0.181	4.269	<0.001
Adjusted R square			0.076		0.247		

3. Multiple Linear Regression Analysis of Factors Influencing Total PCAT-AS Scores

The multiple linear regression analysis revealed a significant association between attendance at specialized outpatient clinics and the total PCAT-AS score in *Model I* (Table 2). After controlling for demographic characteristics and healthcare utilization, patients in the specialized outpatient clinic group had higher total PCAT-AS scores than those in the general outpatient clinic group ($\beta = 0.195, P < 0.001$) in *Model II. The* analysis also showed that chronic disease patients with higher total PCAT-AS scores were generally older (≥ 71 years: $\beta = 0.179, P < 0.001$). Furthermore, patients who were aware of the risks associated with their chronic disease (β = 0.166, $P < 0.001$) and those whose attending physician or family doctor had provided relevant disease-related

health education (*β = 0.181, P < 0.001*) also had higher PCAT-AS scores. In contrast, patients covered by urban employee health insurance (*β = -0.194, P < 0.001*), those reporting a moderate (*β = -0.137, P = 0.001*) or low (*β = -0.099, P = 0.019*) healthcare cost burden had significantly lower total PCAT-AS scores.

Discussion

1. Overall Primary Care Experience Among Patients with Chronic Diseases

Using the internationally developed and Chinese-validated PCAT-AS, this study evaluated the experiences of patients with chronic diseases receiving primary healthcare services in Shanghai. Overall, the mean total score for primary care experience among community health centre (CHC) patients was 32.14 ± 4.72, which is higher than the score reported in a 2011 study conducted in Shanghai (27.20) [22], and comparable to the findings of a 2020 study (30.84 ± 3.30) [10]. These results indicate a steady improvement in patient-perceived primary healthcare quality in Shanghai over the past decade, suggesting that recent community health reforms have effectively enhanced the performance of primary care services.

Moreover, this study found that patients attending specialized combined outpatient clinics (collaborations between general practitioners and specialists) reported significantly higher scores across all dimensions and in total PCAT-AS compared to those visiting general outpatient clinics. This difference may be attributed to Shanghai's comprehensive healthcare reform initiatives, which have strengthened the specialty and disease-specific service capacity of CHCs. According to a 2021 survey of 239 CHCs in Shanghai [4], 187 centres (78.2%) had established integrated specialist-generalist clinics, among which 134 centres (71.7%) operated diabetes clinics and 66 centres (35.3%) operated COPD clinics. These integrated clinics provide patients with more comprehensive, continuous, and personalized healthcare services, leading to higher patient satisfaction and PCAT-AS scores. Shi et al. also reported that patients with chronic diseases achieved better outcomes in integrated specialist-generalist clinics than in general outpatient settings, consistent with the findings of this study [4]. Together, these results reinforce the growing recognition that specialist–generalist collaboration can enhance both service quality and patient experience in primary care.

2. Differences in PCAT-AS Scores Between the Two Models of Care

The present findings demonstrate that patients with diabetes attending specialized outpatient clinics scored significantly higher across all PCAT-AS dimensions and in total scores compared with those attending general outpatient clinics. This may be because diabetes specialty clinics integrate the expertise of general practitioners and endocrinologists, enabling more precise glycemic monitoring, targeted interventions, and comprehensive chronic disease management. As a result, patients are more confident in their treatment outcomes and more engaged in self-management. These findings align with Lu et al. [12], who observed that patients with better glycemic control reported higher total and dimensional PCAT scores than those with poor control. Similarly, Australia's Diabetes Alliance Program, which promotes collaboration between specialists and primary care teams, has been shown to improve patient experiences, reduce diabetes-related complications, and lower hospitalization rates [24]. Furthermore, a meta-analysis including 12 studies (seven randomized controlled trials and five before–after studies) found that integrating specialist participation into primary care teams was significantly associated with lower HbA1c levels compared with standard diabetes

management [25]. Thus, the integrated specialist-generalist care model plays a positive role in strengthening patients' health beliefs, improving self-monitoring behaviors, and achieving key glycemic control targets.

For patients with COPD, the specialized outpatient clinic group also scored significantly higher in total PCAT-AS and in five dimensions: First-contact Utilization, First-contact Accessibility, Comprehensiveness (Available Services), Comprehensiveness (Service Provision), and Patient- and Family-centred Care ($P < 0.05$). This finding suggests that collaboration between general practitioners and respiratory specialists facilitates earlier recognition and timely intervention for COPD exacerbations, reducing the risk of acute episodes.

These results are consistent with findings from a UK community-based study, which demonstrated that specialist-supported multidisciplinary primary care teams improved diagnostic accuracy, adherence to clinical guidelines, and patient satisfaction among COPD patients [26]. However, no significant differences were found between the two groups in Continuity of Care, Coordination (Referrals), Coordination (Information Systems), Community Orientation, and Patient-provider Communication. This may reflect the general improvement in primary care quality among general practitioners due to ongoing healthcare reform initiatives [27], which emphasize comprehensive, team-based management. Family doctor teams are now increasingly capable of assessing the major health risks and needs of their enrolled populations and developing tailored health management plans.

The integrated general–specialist disease clinic refers to specialized diagnostic and treatment services provided by community health institutions on the foundation of general medical practice [13]. Community-based integrated general–specialist outpatient clinics have expanded the scope of diagnosis and treatment services available in primary care, thereby enhancing the specialized diagnostic and treatment capabilities of community medical personnel. Patients with chronic diseases can receive personalized care from family doctors and obtain near-specialist-level diagnosis and treatment during their initial visit within the community. This model directly promotes the utilization of community-based first visits.

Many community integrated general–specialist outpatient clinics are operated by experts from secondary or tertiary hospitals who provide medical services within community settings [4]. As a result, patients face fewer transportation barriers to large hospitals, and appointment cycles and waiting times have been significantly reduced, thereby improving the accessibility of community-based first visits. The integrated general–specialist disease clinic is not limited to disease treatment; rather, it encompasses the entire continuum of care—from prevention, screening, diagnosis, and treatment to rehabilitation and long-term management. This model, grounded in general medical care and supported by specialized diagnostic and treatment services, ensures continuity and integration of care while enhancing patients' service experiences in terms of both the comprehensiveness of available services and the quality of service delivery.

3. Factors Influencing Primary Care Experiences Among Patients with Chronic Diseases

The results of this study identified several key factors influencing patients' overall PCAT-AS scores, including age, type of health insurance, self-perceived financial burden of healthcare, awareness of chronic disease risks, and whether the attending or family physician provided health education related to the disease.

Older patients (≥ 71 years) tended to report higher evaluations of primary healthcare service quality. Elderly patients with chronic diseases typically have more complex conditions and a greater need for long-term and

continuous health management. They are more likely to have established stable, trusting relationships with community physicians, which enhances their perception of care quality. Additionally, due to mobility limitations or transportation challenges, older patients tend to prefer nearby primary healthcare institutions. Regular follow-up, medical record management, and chronic disease monitoring services provided by these centres effectively meet their healthcare needs. This finding is consistent with a Korean study [28], which collected data from patients attending family medicine clinics and found that older adults with relatively stable health conditions had higher overall PCAT scores.

Patients' awareness of the risks associated with their chronic conditions also significantly influenced their evaluations of primary healthcare quality. Those who understand the severity and long-term implications of their illnesses are more motivated to engage in preventive and management behaviors. Enhanced disease awareness strengthens patients' trust in physicians' professional guidance and treatment plans, encouraging adherence to medical advice and participation in community-based health programs. Consequently, such patients report higher satisfaction with healthcare services. Breckner et al. [29] similarly found that greater patient engagement was positively associated with primary healthcare utilization. Patients who are proactive in learning about their disease risks tend to make fuller use of community health services, resulting in higher PCAT scores.

The provision of disease-related health education by attending or family physicians was another significant factor influencing patients' evaluation of primary healthcare quality. Health education improves patients' understanding of their conditions, enhances health literacy, and facilitates behavioral change. During this educational process, effective physician–patient communication allows patients to better comprehend and adhere to treatment recommendations, improving compliance and health outcomes. Moreover, health education is often tailored to individual needs—such as disease type and stage—making patients perceive services as more personalized and professional, thereby enhancing their satisfaction. Family physicians play a particularly critical role in chronic disease management among the elderly, which contributes to higher patient evaluations of community healthcare services. These findings are consistent with the results of Huang et al. [30] and Liu et al. [31], who also reported that health education and family physician involvement significantly improved patient-perceived care quality.

In terms of health insurance type, patients covered by urban employee medical insurance reported higher PCAT-AS scores than those enrolled in urban–rural resident medical insurance. This may be because urban employee insurance generally offers higher reimbursement rates, reducing patients' financial burden and allowing them to more fully utilize community health services. Additionally, urban employees typically have higher educational attainment and greater health awareness, making them more likely to engage proactively in preventive care and chronic disease management.

Interestingly, this study found no significant association between educational level and total PCAT-AS scores. This may be due to the relatively low proportion of patients with university-level education or above seeking care at primary healthcare institutions, as this demographic tends to prefer large tertiary hospitals. A study conducted in Beijing [32] similarly found that patients with a university education or higher were more likely to seek care at tertiary hospitals rather than at community facilities.

Strengths and Limitations

This study has several notable strengths. First, it is among the few empirical investigations to compare patients' experiences of community-based integrated specialist–generalist clinics and general outpatient clinics using the validated Chinese version of the PCAT-AS. This approach allows for a comprehensive, internationally comparable assessment of primary healthcare quality from the patient's perspective. Second, the study employed a multi-stage sampling design across urban, suburban, and rural primary healthcare institutions in Shanghai, enhancing the representativeness and robustness of the data within the region. Third, by including both diabetes and COPD as tracer conditions, the study captured two of the most prevalent chronic diseases in community settings, providing valuable insights into integrated care for chronic disease management.

However, several limitations should be acknowledged. First, the study's geographical scope and sample size were limited to selected primary healthcare institutions, each representing one integrated specialist clinic and one general outpatient clinic. Therefore, the findings may not be fully generalizable to other regions or institutions not included in the survey. Second, some of the integrated clinics had been established only recently, and their influence on patient experience might not yet be fully evident; thus, patients' perceptions could underestimate the long-term benefits of integration. Third, the disease coverage was narrow, focusing solely on diabetes and COPD. This restricts the ability to generalize findings to other chronic conditions or patient populations utilizing community healthcare services.

Despite these limitations, the study provides important empirical evidence supporting the potential of integrated specialist–generalist models to enhance primary care quality and patient experience in community health systems.

Conclusion

This study evaluated the quality of primary healthcare services based on patient experiences at primary healthcare institutions (CHCs) in Shanghai, China, where integrated specialist–generalist clinics have been established. Focusing on patients with two of the most common chronic diseases—diabetes mellitus and COPD—the study assessed how these integrated care models influence patient-perceived service quality. The findings revealed that patients attending integrated specialist outpatient clinics reported significantly higher scores across all dimensions and in total PCAT-AS scores than those visiting general outpatient clinics. Specifically, among patients with diabetes, both the total and dimensional PCAT-AS scores were higher in the specialized clinic group. Among COPD patients, the specialized clinic group also demonstrated higher total scores and significantly higher scores in First-contact Utilization, First-contact Accessibility, Comprehensiveness (Available Services), Comprehensiveness (Service Provision), and Patient- and Family-centred Care. However, all primary healthcare institutions exhibited weaknesses in Coordination (Referrals) and Community Orientation. To further enhance patients' experiences with primary healthcare, policy efforts should focus on strengthening referral mechanisms between primary healthcare institutions and higher-level hospitals to ensure seamless service integration. Priority access to registration, diagnostic testing, and hospitalization should be provided to referred patients to reduce waiting times and improve care continuity. In addition, primary healthcare institutions should progressively expand home-visit and outreach services, especially for elderly or mobility-impaired patients, and develop targeted care measures to enhance the accessibility and convenience of healthcare services for older adults. Strengthening these dimensions will not

only improve patient satisfaction and health outcomes but also promote the sustainable development of an equitable and efficient primary healthcare system in China.

Abbreviations

PCAT: Primary care assessment tool;

PCAT-AS: Primary Care Assessment Tool-Adult Short

ANOVA: Analysis of variance

SPSS: Statistical Package for Social Sciences

TCM: Traditional Chinese medicine

COPD: Chronic obstructive pulmonary disease

PHC: Primary health care

SPO: Structure-Process-Outcome

CHC: Community health centre

Declarations

Ethics approval and consent to participate

We acquired the written informed consent from the study participants. This study was approved by the Ethics Committee of Tongji University's Affiliated Yangpu Hospital (Approval No.: LL-2024-LW-035). Participant personal information was not available to individuals who did not participate in the research.

Consent for publication

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contribution

SY, HYL,DHY and HJ conceived and designed the study, performed statistical analysis, and wrote/revised the manuscript;HYL and SY organized data, conducted statistical analysis, and contributed to manuscript writing; JJW, HZZ and QQF performed data curation and statistical analysis; JJW, HJ and ZHZ distributed and collected questionnaires; SY and HJ oversaw study design, supervised the project, and ensured manuscript quality; DHY contributed to study conception, implemented the survey, revised the manuscript, and supervised research quality, and all authors contributed to final approval of the paper.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Figures

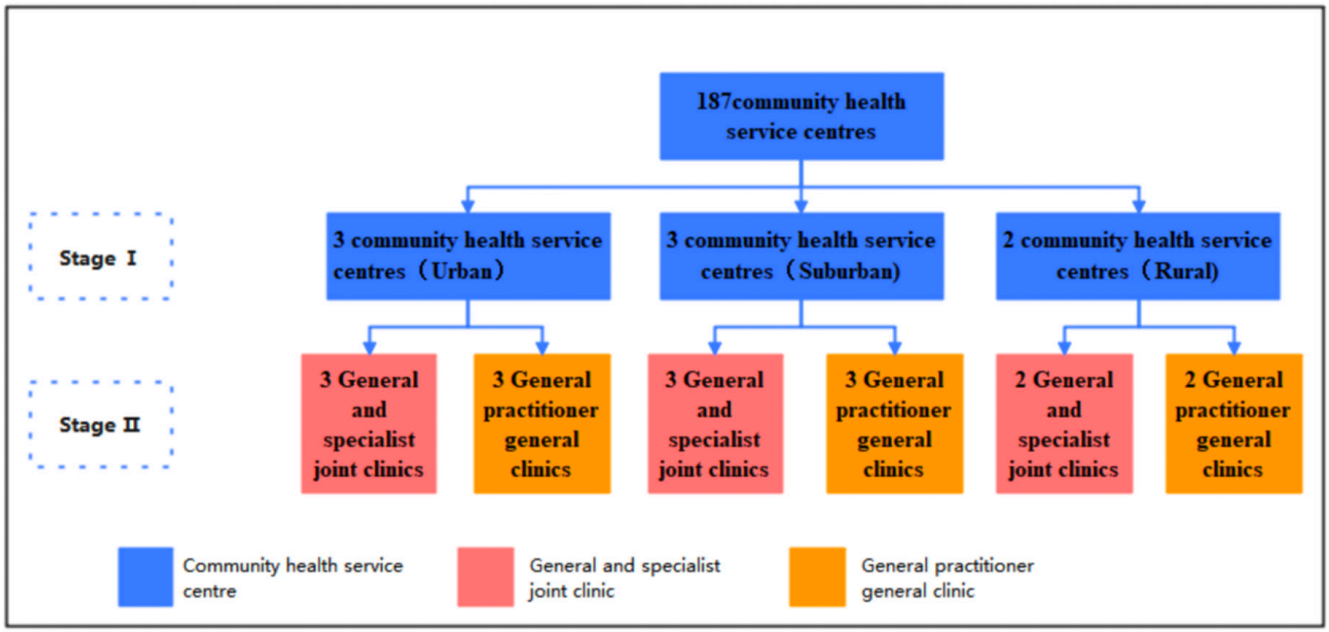

Fig. 1 The selection process of general and specialist joint clinic and general practitioner general clinic

Figure 1

The selection process of general and specialist joint clinic and general practitioner general clinic

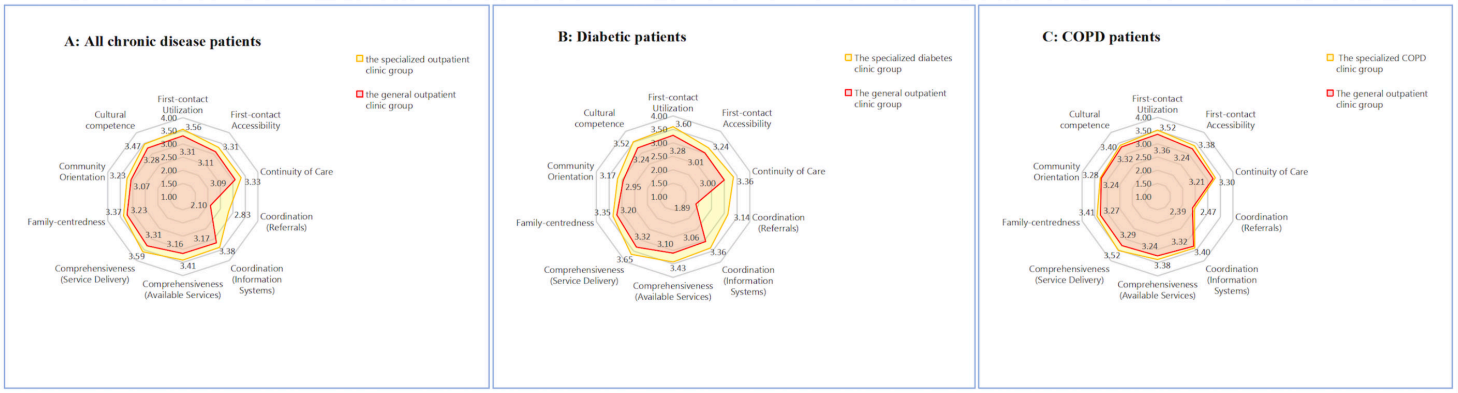

Fig. 2 The scores of PCAT-AS in various dimensions for patients in the specialized outpatient clinic group and the general outpatient clinic group

Figure 2

The scores of PCAT-AS in various dimensions for patients in the specialized outpatient clinic group and the general outpatient clinic group

Supplementary Files

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